Space Weather Forecast

Issued on Wednesday, 31 May 2023 at 13:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1/R2 radio blackouts throughout. Slight chance of isolated Minor storm intervals on 01 and 02 June.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate over the last 24 hours, with two Moderate-class flares observed. The first was from a magnetically complex region in the southwest quadrant during 30 May. The second was from a region emerging onto the southeast limb, which has yet to reveal significant complexity due its location. A further complex region in the centre south disc has not produced any significant flare activity. These are three of 12 classified sunspot regions on the visible disc, with the remaining regions either weak, decaying or stable. No Earth-directed Coronal Mass Ejections (CMEs) were observed during the period.

Solar Wind / Geomagnetic Activity: Solar winds have been at ambient levels as the Earth transits through a region of background solar winds. Magnetic field strength has been weak, with the north-south component also fluctuating weakly. Resultant geomagnetic activity was Quiet throughout the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be Moderate, with an increasing risk of High levels due mainly to the two complex regions in the southwest quadrant, and a newly numbered but increasingly active region on the southeast limb.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 26 May could arrive at Earth on 31 May, but with low confidence. A fast solar wind is forecast to connect with Earth either late on 01 June or more likely on 02 June, with solar winds forecast to reach elevated levels. Geomagnetic activity is expected to be mainly Quiet to Unsettled, with a slight chance of Active to G1/Minor Storm intervals on 01 or 02 June due to the forecast onset of the fast solar wind.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background levels with solar radiation storms unlikely to occur. However, there is a slight chance of reaching the Minor Storm threshold should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	20	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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